What is claimed is:

1. An inflator device comprising:

a diffuser chamber;

a first combustion chamber connected to said diffuser chamber;

a supply of a first gas-generating pyrotechnic material having a burn rate that is pressure dependent contained within said first combustion chamber and wherein at least a portion of said supply of the first gas-generating pyrotechnic material is reactable, the first gas-generating pyrotechnic material having a burn rate pressure dependency of at least about 0.55, where the burn rate pressure dependency is represented by n in a burn rate expression:

$$r_b = k(P)^n$$

where r_b is the burn rate of the first gas-generating pyrotechnic material, k is a constant, P is a combustion pressure, and n is a slope of a linear regression line drawn through a log-log plot of burn rate versus pressure;

a controlling orifice formed by said first combustion chamber and providing independent fluidic communication between said first combustion chamber and said diffuser chamber, said controlling orifice throttling a single stage combustion wherein said supply of the first gas-generating pyrotechnic material is selectively reactable to produce a first combustion chamber single stage combustion product gas;

a second combustion chamber connected to said diffuser chamber;

a supply of a second gas-generating pyrotechnic material contained within said second combustion chamber and wherein at least a portion of said supply of the second gas-generating pyrotechnic material is reactable;

a controlling orifice formed by said second combustion chamber and providing independent fluidic communication between said second combustion chamber and said diffuser chamber, said controlling orifice throttling a single stage combustion wherein said supply of the second gas-generating pyrotechnic material is selectively reactable to produce a second combustion chamber single stage combustion product gas; and

a plurality of diffuser orifices formed in said diffuser chamber, said diffuser orifices throttling a dual stage combustion wherein said supply of the first gas-generating pyrotechnic material is reactable to produce a first combustion chamber dual stage combustion product gas and said supply of the second gas-generating pyrotechnic material is reactable to produce a second combustion chamber dual stage combustion product gas.

2. The inflator device of claim 1 wherein during the single stage combustion of said supply of the first gas-generating pyrotechnic material, said supply of the first gas-generating pyrotechnic material having a burn duration of at least about 60 msec.

3. The inflator device of claim 1 wherein during the dual stage combustion of said supply of the first gas-generating pyrotechnic material, said supply of the first gas-generating pyrotechnic material having a burn duration of less than about 60 msec.

4. The inflator device of claim 1 wherein during the single stage combustion and the dual stage combustion of said supply of the second gas-generating pyrotechnic material, said supply of the second gas-generating pyrotechnic material having a burn duration of less than about 50 msec.

5. The inflator device of claim 1 wherein during the dual stage combustion the reaction of said supply of the second gas-generating pyrotechnic material is offset about 5 msec to about 30 msec with respect to the reaction of said supply of the first gas-generating pyrotechnic material.

6. The inflator device of claim 1 further comprising:

a first initiator in discharge communication with said first combustion chamber, and in operational initiating contact with said supply of the first gas-generating pyrotechnic material; and

a second initiator in discharge communication with said second combustion chamber, and in operational initiating contact with said supply of the second gas-generating pyrotechnic material,

wherein during the single stage combustion one of said first initiator and said second initiator is activatable, wherein activation of said first initiator results in initiation of the reaction of said supply of the first gas-generating pyrotechnic material and activation of said second initiator results in initiation of the reaction of said supply of the second gas-generating pyrotechnic material, and during the dual stage combustion said first initiator is activatable to initiate the reaction of said supply of the first gas-generating pyrotechnic material and said second initiator is activatable to initiate the reaction of said supply of the second gas-generating pyrotechnic material.

7. A method for operating the inflator device of claim 6 comprising:

initiating one of said first initiator to initiate reaction of at least a portion of said supply of the first gas-generating pyrotechnic material to produce said first combustion chamber single stage combustion product gas and said second initiator to initiate reaction of at least a portion of said supply of the second gas-generating pyrotechnic material to produce said second combustion chamber single stage combustion product gas.

8. A method for operating the inflator device of claim 6 comprising:

initiating said first initiator to initiate reaction of at least a portion of said supply of the first gas-generating pyrotechnic material to produce said first combustion chamber dual stage combustion product gas; and

initiating said second initiator to initiate reaction of at least a portion of said supply of the second gas-generating pyrotechnic material to produce said second combustion chamber dual stage combustion product gas, wherein an internal combustion pressure developed within said first combustion chamber increases to increase the burn rate of the first gas-generating pyrotechnic material.

9. The inflator device of claim 1 further comprising a cooling medium contained within said diffuser chamber.

10. The inflator device of claim 1 wherein during the single stage combustion the first gas-generating pyrotechnic material has a maximum inflating flow rate of at least about 30 kmol-K/sec.

11. The inflator device of claim 1 wherein during the single stage combustion the first gas-generating pyrotechnic material has a maximum integrated inflating flow of about 1.7 kmol-K.

12. The inflator device of claim 1 wherein during the single stage combustion the second gas-generating pyrotechnic material has a maximum inflating flow rate of at least about 44 kmol-K/sec.

13. The inflator device of claim 1 wherein during the dual stage combustion the first gas-generating pyrotechnic material and the second gas-generating pyrotechnic material have a combined maximum inflating flow rate of at least about 90 kmol-K/sec.

14. The inflator device of claim 1 wherein during the dual stage combustion the first gas-generating pyrotechnic material and the second gas-generating pyrotechnic material have a combined maximum integrated inflating flow of about 2.9 kmol-K.

15. The inflator device of claim 1 wherein during the dual stage combustion an internal pressure of at least about 2500 psi is developed within each of said first combustion chamber and said second combustion chamber.

16. The inflator device of claim 1 wherein the first gas-generating pyrotechnic material having a burn rate pressure dependency of at least about 0.65.

17. The inflator device of claim 1 wherein the first gas-generating pyrotechnic material having a burn rate pressure dependency within a range of about 0.65 to about 0.70.

18. The inflator device of claim 1 wherein said supply of the second gas-generating pyrotechnic material has a burn rate that is pressure dependent, the second gas-generating pyrotechnic material having a burn rate pressure dependency of at least about 0.55, where the burn rate pressure dependency is represented by n in a burn rate expression:

$$r_b = k(P)^n$$

where r_b is the burn rate of the second gas-generating pyrotechnic material, k is a constant, P is a combustion pressure, and n is a slope of a linear regression line drawn through a log-log plot of burn rate versus pressure.

19. An inflator device comprising:

a diffuser chamber;

a first combustion chamber connected to said diffuser chamber;

a supply of a first gas-generating pyrotechnic material having a burn rate that is pressure dependent contained within said first combustion chamber and wherein at least a portion of said supply of the first gas-generating pyrotechnic material is reactable, the first gas-generating pyrotechnic material having a burn rate pressure dependency of at least about 0.55, where the burn rate pressure dependency is represented by n in a burn rate expression:

$$r_b = k(P)^n$$

where r_b is the burn rate of the first gas-generating pyrotechnic material, k is a constant, P is a combustion pressure, and n is a slope of a linear regression line drawn through a log-log plot of burn rate versus pressure;

a first initiator in discharge communication with said first combustion chamber, and in operational initiation communication with said supply of the first gas-generating pyrotechnic material, said first initiator selectively initiating reaction of said supply of the first gas-generating pyrotechnic material in one of a single stage combustion and a dual stage combustion;

at least one controlling orifice formed by said first combustion chamber and providing independent fluidic communication between said first combustion chamber and said diffuser chamber, said at least one controlling orifice throttling the reaction of said supply of the first gas-generating pyrotechnic material during the single stage combustion to produce a first combustion chamber single stage product gas;

a second combustion chamber connected to said diffuser chamber;

a supply of a second gas-generating pyrotechnic material contained within said second combustion chamber and wherein at least a portion of said supply of the second gas-generating pyrotechnic material reactable;

a second initiator in discharge communication with said second combustion chamber, and in operational initiation communication with said supply of the second gas-generating pyrotechnic material, said second initiator selectively initiating reaction of said supply of second gas-generating pyrotechnic material in one of the single stage combustion and the dual stage combustion;

at least one controlling orifice formed by said second combustion chamber, and providing independent fluidic communication between said second combustion chamber and said diffuser chamber, said at least one controlling orifice throttling the reaction of said supply of second gas-generating pyrotechnic material during the single stage combustion to produce the second combustion chamber single stage product gas; and

a plurality of diffuser orifices formed by said diffuser chamber, said diffuser orifices throttling the reaction of said supply of the first gas-generating pyrotechnic material and said supply of the second gas-generating pyrotechnic material during the dual stage combustion, wherein said supply of the first gas-generating pyrotechnic material is reactable to produce a first combustion chamber dual stage combustion product gas and said supply of the second

gas-generating pyrotechnic material is reactable to produce a second combustion chamber dual stage combustion product gas.

20. The inflator device of claim 19 wherein said supply of the second gas-generating pyrotechnic material has a burn rate that is pressure dependent, the second gas-generating pyrotechnic material having a burn rate pressure dependency of at least about 0.55, where the burn rate pressure dependency is represented by n in a burn rate expression:

$$r_b = k(P)^n$$

where r_b is the burn rate of the second gas-generating pyrotechnic material, k is a constant, P is a combustion pressure, and n is a slope of a linear regression line drawn through a log-log plot of burn rate versus pressure.

21. The inflator device of claim 20 wherein at least one of the first gas-generating pyrotechnic material and the second gas-generating pyrotechnic material having a burn rate pressure dependency of at least about 0.65.

22. The inflator device of claim 20 wherein at least one of the first gas-generating pyrotechnic material and the second gas-generating pyrotechnic material having a burn rate pressure dependency of about 0.65 to about 0.70.

23. The inflator device of claim 19 wherein during the single stage combustion said at least one controlling orifice formed in said first combustion chamber controls an internal combustion pressure developed within said first combustion chamber.

24. The inflator device of claim 19 wherein during the single stage combustion said at least one controlling orifice formed in said second combustion chamber controls an internal combustion pressure developed within said second combustion chamber.

25. The inflator device of claim 19 wherein during the dual stage combustion said plurality of diffuser orifices control an internal combustion pressure developed within said first combustion chamber and said second combustion chamber.

26. The inflator device of claim 19 wherein during the single stage combustion an internal combustion pressure formed within one of said first combustion chamber and said second combustion chamber is not greater than about 2000 psi.

27. The inflator device of claim 19 wherein during the dual stage combustion an internal combustion pressure developed within said first combustion chamber and said second combustion chamber is greater than about 2500 psi.

28. A combination comprising:

an inflator device including a diffuser chamber forming a plurality of diffuser orifices, a first combustion chamber connected to said diffuser chamber containing a supply of a first gas-generating pyrotechnic material having a burn rate that is pressure dependent, the first gas-generating pyrotechnic material having a burn rate pressure dependency of at least about 0.55, a first initiator in discharge communication with said first combustion chamber, and in operational initiating contact with said supply of the first gas-generating pyrotechnic material, at least one controlling orifice formed by said first combustion chamber providing independent fluidic communication between said first combustion chamber and said diffuser chamber, a second combustion chamber connected to said diffuser chamber containing a supply of a second gas-generating pyrotechnic material, a second initiator in discharge communication with said second combustion chamber, and in operational initiating contact with said supply of the second gas-generating pyrotechnic material, and at least one controlling orifice formed by said second combustion chamber providing independent fluidic communication between said second combustion chamber and said diffuser chamber; and

a control assembly in operational control communication with said inflator device, and providing a reaction initiating signal to one of said first initiator to initiate reaction of at least a portion of said supply of the first gas-generating pyrotechnic material contained within said first combustion chamber and said second initiator to initiate reaction of at least a portion of said supply of the second gas-generating pyrotechnic material contained within said second combustion chamber during a single stage combustion, and providing a reaction initiating signal to said first initiator to initiate reaction of said supply of the first gas-generating pyrotechnic material and said second initiator to initiate reaction of said supply of the second gas-generating pyrotechnic material during a dual stage combustion.